Geology of the Rexburg Bench

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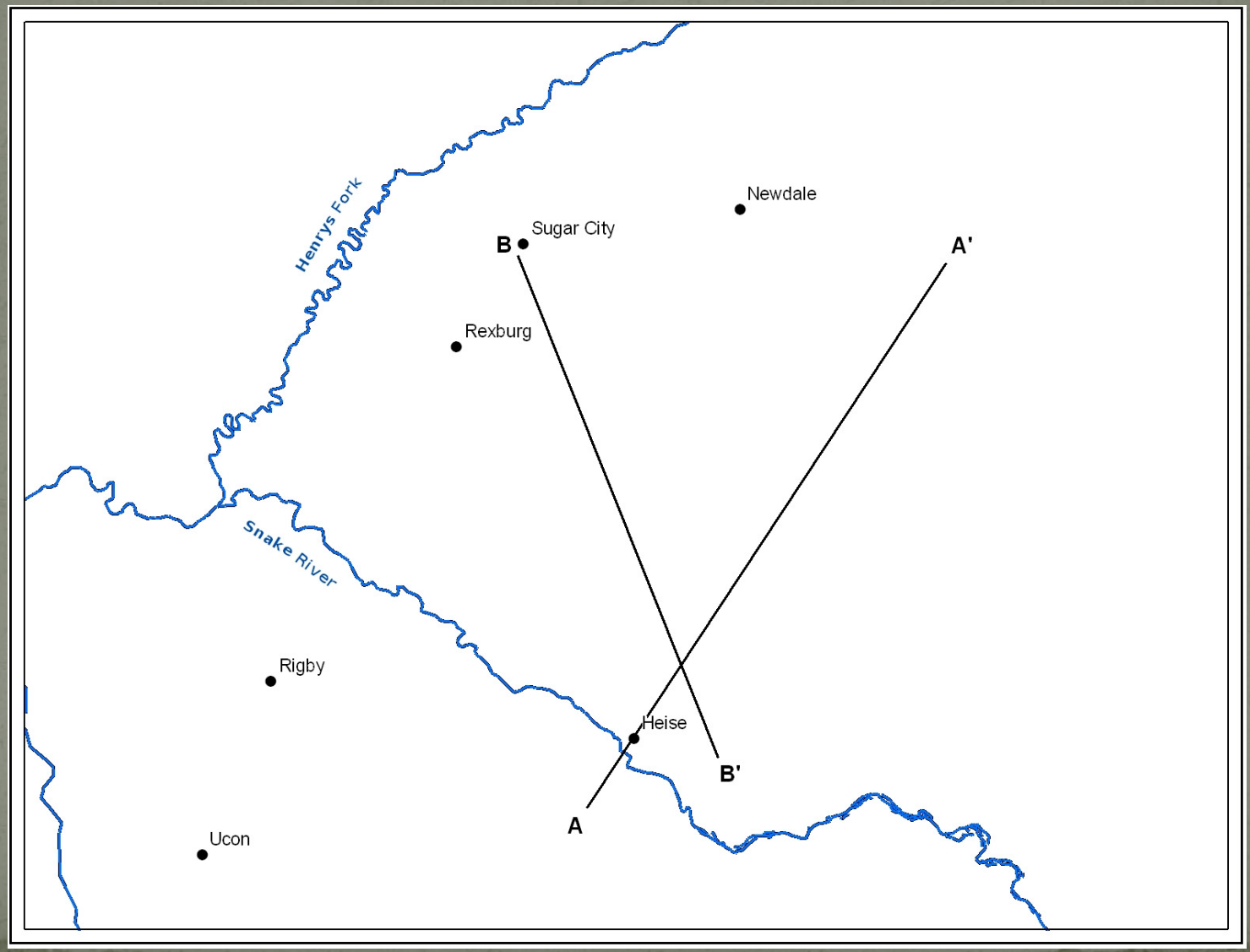
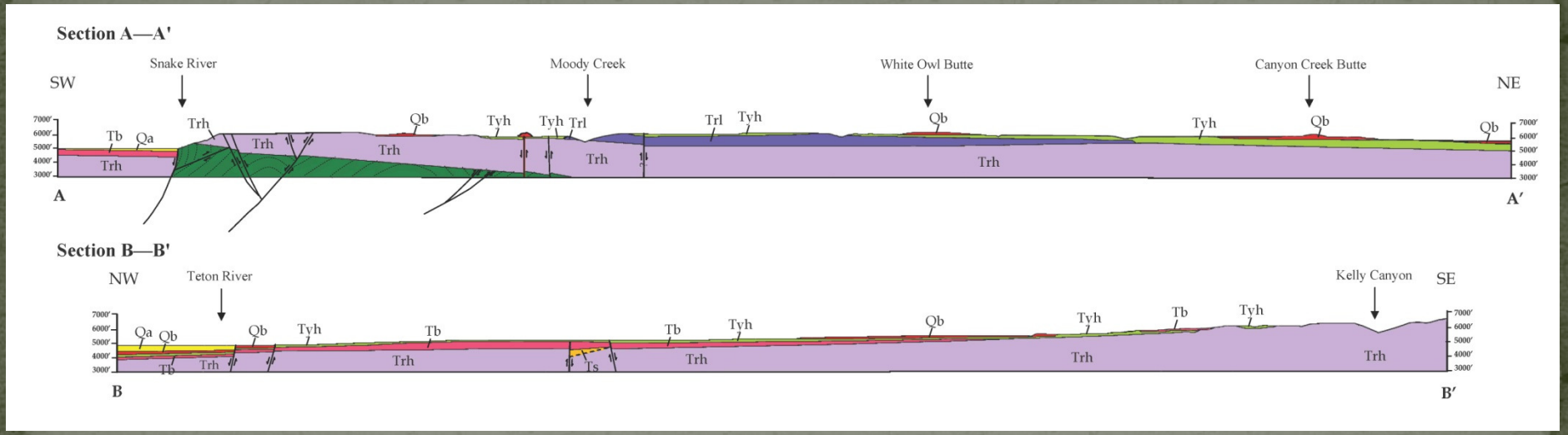
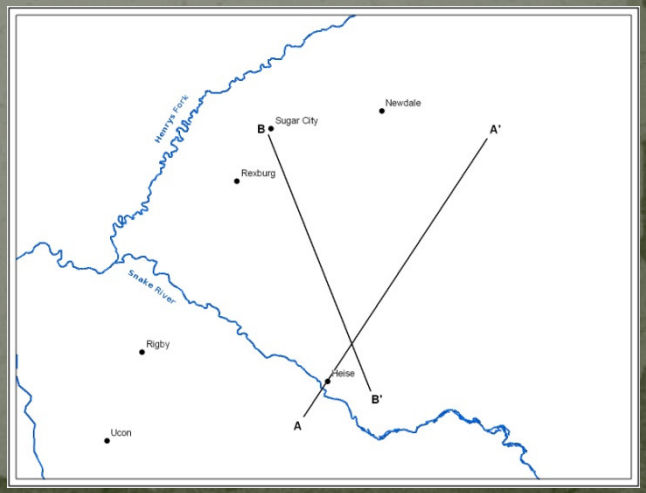
Structure Cross Sections



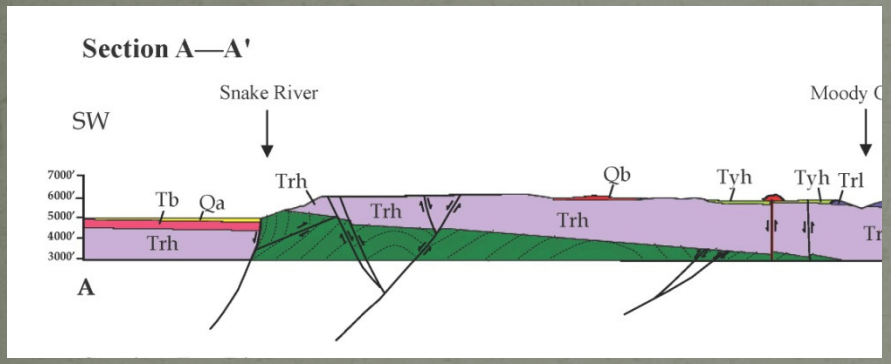

Section A—A'
SW
NE
Snake River
Moody Creek
White Owl Butte
Canyon Creek Butte
Tb
Qa
Trh
Qb
Tyh
Trl
7000′
6000′
5000′
4000′
3000′
A
A′
Section B—B'
NW
SE
Teton River
Kelly Canyon
Ts
B
B′


Henrys Fork
Newdale
Sugar City
B
A'
Rexburg
Snake River
Rigby
Heise
B'
A
Ucon

Interpretation of Structure Sections

Indicates that there is little likelihood that ground water from the Rexburg Bench area is a significant contributor to the South Fork of the Snake River.

Interpretation of Mesozoic/Paleozoic Rocks

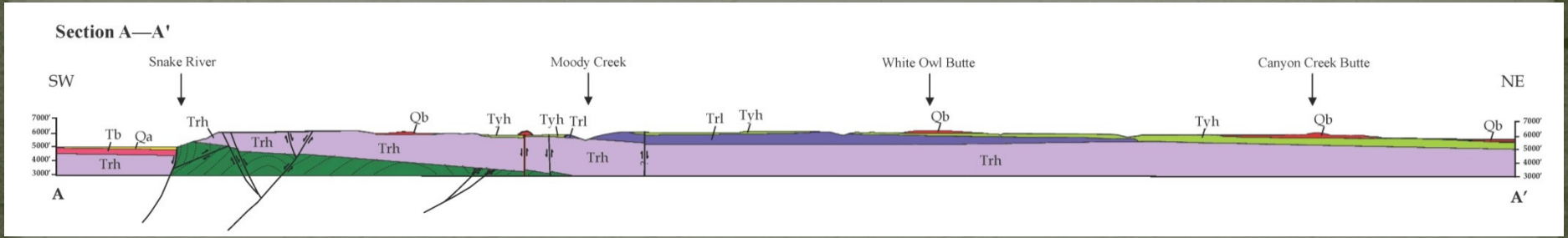


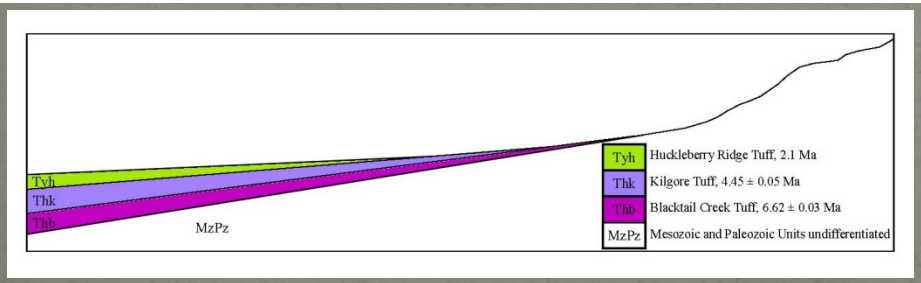
- Steeply dipping thrust faults and intense folding
- Numerous shale units
- Steep east dipping fold limbs

Inhibits flow to the South Fork

Interpretation of Volcanic Units

- Heise Volcanic units dip ~5-20° to the northeast or north
- Post Heise units are more gentle, dipping ~2-5° to the north or northwest
- On-lap relationships of Heise Volcanics cause them to pinch out to the southwest



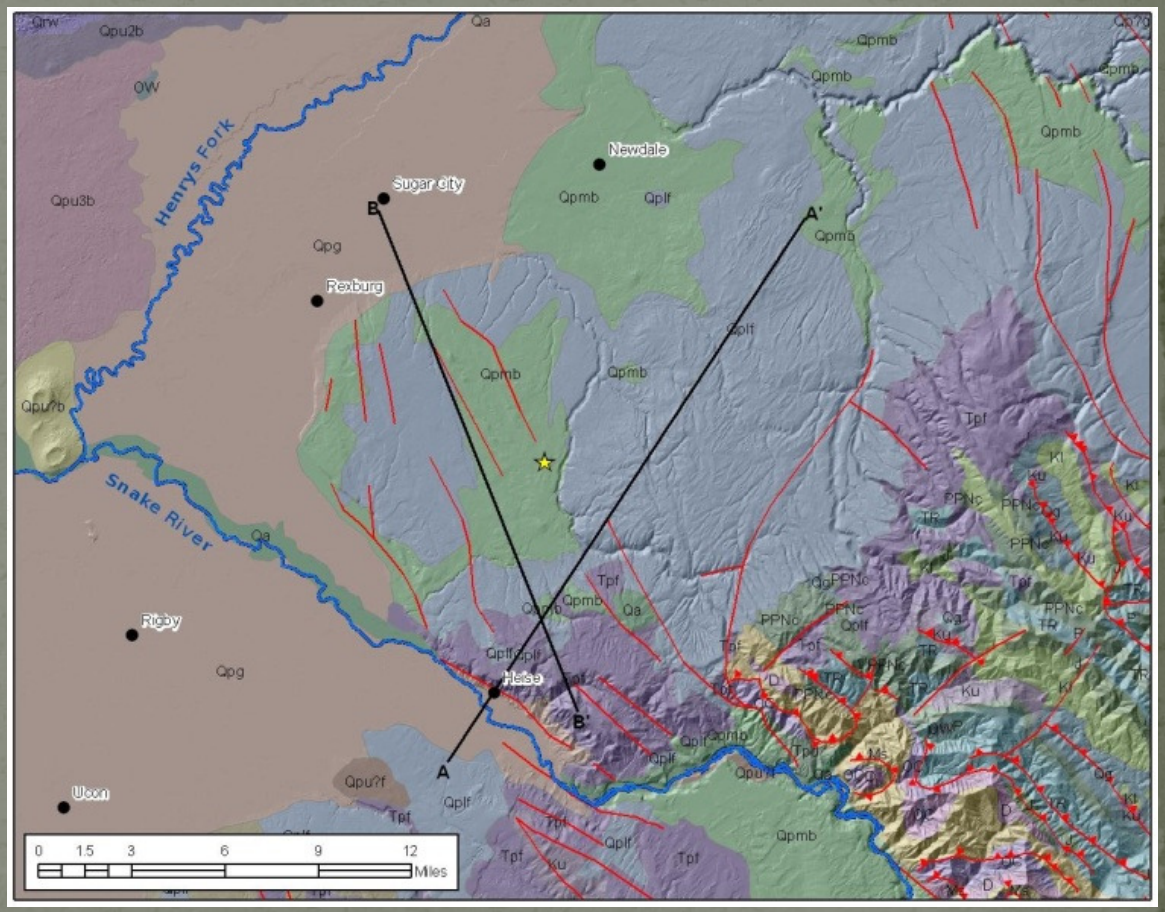


Stylized bedding planes within the Trh unit reflect the typical on-lap relationship seen within this package.

Promotes flow away from South Fork

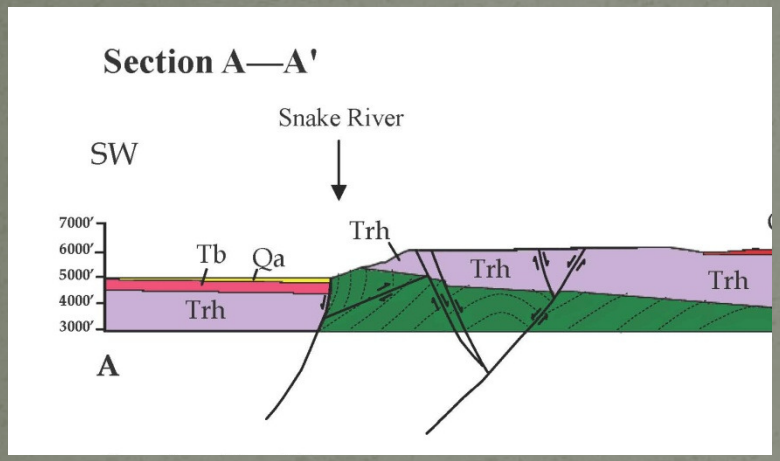
Interpretation of Rift Zone

- Northwest trending volcanic rift zone that appears to be a continuation of the Grand Valley Fault
- At least 10 basaltic vents located along the rift zone
- Similar to the rift zones on Snake River Plain, where feeder dikes act as dams to southwestward flow
- Dike system on Bench would behave similarly, directing flow toward Sugar City



Inhibits flow toward the South Fork

Interpretation of Graben

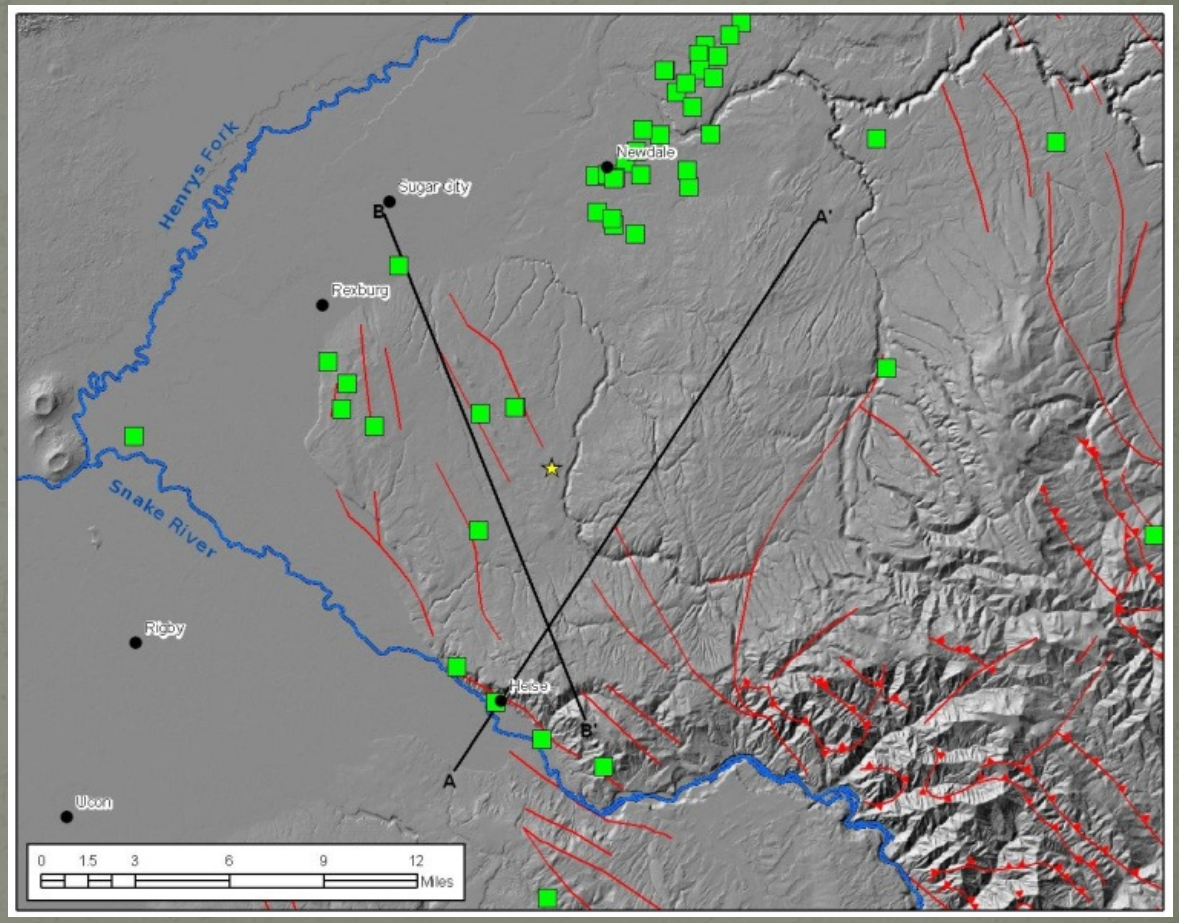


- South Fork hugs the Heise side of the graben
- Antelope Flat and Ririe Reservoir have sloping topography, which suggests that displacement on the Heise fault is greater than the faults on the southwest side of the valley
- The northeast side of the graben is dropping faster than the southwest side
- The graben floor dips gently to the northeast

Inflows to the South Fork are from the southwest.

Interpretation of Geothermal System

- Several warm springs along the northwest striking Heise fault
- Hot water is not diluted by moving ground water



Bench aquifer does not extend into the Kelly Mountain area

Conclusion

- Significant geology that inhibits flow from the Rexburg Bench include:
  - Mesozoic and Paleozoic stratigraphy
  - Structure: steeply dipping stratigraphic rocks and thrust faults
  - Dipping volcanic units toward the north or northeast or northwest
  - Volcanic rift zone with dike systems
  - Graben floor dropping faster on northeast side of valley
  - Hot springs along Heise fault

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